With this collection at hand a much more attractive and scientific study of literature than now prevails might easily be introduced into the schools. One set in the school library would be quite sufficient for a school of moderate size. The period could be studied with constant references from the teacher to these sources, which the students would find delight in verifying. The possibilities of such work have not been realized, in the study of English literature at least, for the lack of material. Now with such a rare collection so easily available it hardly admits of doubt that many teachers will be eager to try a method that is so full of promise, and so thoroughly in accord with the best practice in other fields. At least it will be well worth the while of every teacher of literature to send for a descriptive catalogue of Professor Arber's works, and to consider seriously whether they cannot and ought not to be used in the way indicated. C. H. THURBER

The Elements of Chemistry. By PAUL C. FREER. Boston: Allyn & Bacon.

THE following is from the author's preface: "The methods of teaching beginners now very generally in use do not make prominent what is *essential* in the science. I have endeavored to familiarize the pupil with the general aspects of chemical changes, using only a few of the most important elements and compounds for the purposes of illustration; the work is *quantitative*, both in the text and in the laboratory appendix. . . . . The atomic theory is not introduced until the pupil has sufficient chemical experience to comprehend its meaning and advantages, and until he thoroughly understands that *theories are based on facts*, not facts on theories. The theory of valence I have only briefly touched upon, as it is not necessary for an understanding of Elementary Chemistry. . . . . Chemical equations I have avoided as much as possible, because I wished to give them only the relative importance which belongs to them. The too frequent use of these equations may lead to the view that all reactions that can be formulated must in reality take place. . . . . The domain of so-called Physical Chemistry can no longer be ignored in work of this kind. For this reason I have introduced some of the simple general facts . . . . notably under the head of electrolysis and double decomposition."

Thus far the author. His performance fully and intelligently carries out his purpose. This plainly was to teach the *laws* of chemistry,

not chemical facts about elements and compounds. This he has succeeded in doing with surprisingly small amount of material. I find that he discusses only H, O, N, Cl, S, C, Na, K; he mentions and uses a few times Zn, Ca, Mg, Fe. Of compounds there are probably not much above thirty discussed in the text, and then not for the purpose of studying their general properties, but only for their bearing on the principle in hand. Only the last chapter opens a glimpse into a larger field by the brief characterization of a number of (mainly non-metallic) elements which form series with those already discussed.

The book is modern in the best sense. The changes of energy during the formation, or the breaking up, of compounds, are discussed, though only briefly. Chapters XVI and XVII present briefly the kinetic theory of gases and the relations between the atomic weight and specific gravity. The interesting relations between the specific heat of gases and their other properties are not touched upon. . . . . There is an interesting chapter on substitutions (XXII). The Physics of Chemistry is introduced to a larger extent than in most books for beginners. The number of purely physical experiments is about ten; prominent are, of course, Boyles' law and Charles' law. Chapter XXIII also enters, though not very far, into the recondite physical constitution of chemical compounds, under the head of Electrolysis and Double Decomposition.

This exposé shows the limits set by the author. Within these limits the book must be declared highly successful. The presentation is simple, free from technical verbiage, and admirably clear and forcible. While every essential principle is treated, conclusions are not pushed beyond the facts. In the allotment of the space to the different principles, also, the book preserves a healthy symmetry.

Each of its twenty-four chapters bears a descriptive heading. These chapters contain the dogmatic part of the book. The experiments themselves are placed in the appendix. There are nominally eighty-one of them, in reality about twice as many, as many of them embrace several distinct parts. Numbers referring to them are placed in the text at the proper points. This device relieves the text of the many breaks that distract the reader's attention when the directions for the experiments are placed in the text. At the end of each subject, whether contained in one chapter (as usual) or several, is placed a concise summary, divided into numbered paragraphs; an excellent feature for class and review work.

The typographical execution is excellent. The book is of handy size, the paper good, devoid of gloss, the type good-sized, open, and clear. The heavy-type descriptive headings over the sections of each chapter, the pleasing spacing, the use of small type for notes and special discussions, all help to give the book a degree of perspicuity of arrangement that could not easily be surpassed. Altogether this must be pronounced one of the most useful as well as one of the handsomest of the text-books recently published.

And yet I should not call it an easy book. I should not like to use it with a class that had not studied Physics before. Perhaps no presentation could have made the subject easy, except one that would have cut out just what the author considers essentials. As a matter of fact many of the generalizations of Chemistry are much harder to grasp for a youthful mind than most of those of Physics. That this view is shared in some very competent places would appear from the relative positions assigned to Physics and Chemistry, for instance, in the Harvard College requirements.

And now, one question of larger bearing. As said above, this book is an admirable representative of the direction science teaching has taken within the last dozen years. Are we moving in the right direction altogether? If I read the principle aright, which the recent books emphasize more and more, it is the use of scientific facts mainly as a means of mental training *by the discovery of the general principles and laws from selected facts and experiments.* Our Beginners' Chemistries aim above all at teaching the chemical *laws*, abstracted from as few elements and compounds as possible; our Botany is Plant Physiology almost altogether, our Zoölogy is Biology. Many of our latter-day text-books are written by university men who write from first-hand knowledge of the subject, which is an inestimable gain. Does the direction in which we are moving also exhibit due regard for the mental characteristics of the age of the students that are to use the books? Are we inclined to demand abstractions of an age that has never yet faced any scientific facts whatever, and is as yet fit for the concrete only? Does our total neglect of systematic and determinative botany breed a race of botany students to whom a walk in the fields is uninteresting, because they do not know a dozen of the plants and flowers they see? Does our chemistry teaching upon philosophical lines breed a race of young chemists who know the law of Avogadro, but think brass an element, and who do not know tin from zinc,

because their instruction did not carry them beyond the non-metallic bodies?

I should not dare to answer any of these questions, but I am old-fashioned enough to recall with delight my first chemistry instruction, which was upon the lines of old Stöckhart, and which made me set up in my room, unbeknown to my teachers, a laboratory, equipped with my weekly allowance money, where I formed a vast number of the compounds as they came up in class, a method which, though it resulted in holes in the carpet, also resulted, through compositions, decompositions, meltings, heatings, precipitations, filtrations, and distillations in a detailed and intimate knowledge of most of the leading elements and their principal compounds that has been of inestimable value to me ever since. My chemical philosophy I learned, most of it, in a subsequent course, at the Polytechnic School.

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Milton's Prosody. By ROBERT BRIDGES. Oxford: The Clarendon Press.

MR. ROBERT BRIDGES brought to his investigation of Milton's blank verse the ear of a poet. His little book affords a solution of many questions which vex the soul of the teacher whose class must scan Paradise Lost today, Samson Agonistes tomorrow. The former poem is hybrid in its metrical theory, but the ruling tradition is the quantitative. In the latter poem Mr. Bridges finds that Milton came to determine his rhythm by stress, "though he learnedly disguised his liberty by various devices." The question cannot be discussed here. It is evident that Mr. Bridges sides with those scholars who insist on a prosody of stress for English poetry. He does not deny that in English two short syllables may sometimes be equivalent to one long one; but it seems to him "wrong to imagine that English rhythms can ever be explained or governed by such a fiction as this, when it is made a general law." Milton's rules of elision will be a welcome subject to teachers. In Paradise Lost open vowels were considered by Milton as theoretically elides: "that is he intended that they should not count in the scansion; yet though he printed *Th' Almighty*, etc., it cannot be supposed that he wished it to be so pronounced." This makes a good working rule of pronunciation; but there is danger that the theory involved